

Having thus described the invention, what is claimed is:

1. In a concrete production apparatus including a mixer having a chamber in which cement, water and aggregate are mixed to create a concrete mix, the improvement comprising:

a turbine mixer operable to receive a supply of dry cement and a supply of water to pre-mix said cement and said water into a cement paste before being introduced into said chamber to be combined with said aggregate, said turbine mixer including a rotatable mixing member that mixes said water and said cement.

2. The concrete production apparatus of Claim 1 further comprising:

a metering mechanism to meter the flow of cement into said turbine mixer.

3. The concrete production apparatus of Claim 2 wherein said turbine mixer comprises:

a housing in which is mounted a cement conveying apparatus operable to receive said supply of dry cement;

an inlet port for connection to said supply of water;

a mixing chamber operably connected to said housing to receive said supply of dry cement from said cement conveying apparatus and said supply of water; and

said mixing member being supported for rotational movement within said mixing chamber to effect a mixing of said cement and said water upon rotation thereof.

4. The concrete production apparatus of Claim 3 wherein said mixing member is formed as a mixing plate having a plurality of agitating fins mounted thereon to effect a mixing of said cement and said water to create said cement paste.

5. The concrete production apparatus of Claim 4 wherein said mixing chamber is formed as a cylindrical structure having a first diameter, said mixing plate having a second diameter smaller than said first diameter to form an annular gap between said mixing plate and said cylindrical structure, said mixing plate dividing said cylindrical structure into an inner chamber and an outer chamber, said cement and said water being received in said inner chamber and said cement paste being discharged from said outer chamber.

6. The concrete production apparatus of Claim 5 wherein said agitating fins are mounted on a circumferential periphery of said mixing plate for movement along said annular gap.

7. The concrete production apparatus of Claim 6 wherein said cement conveying apparatus is an auger rotatably supported in said housing to direct dry cement into said mixing chamber, said auger being operatively connected to a drive mechanism for rotation thereof at a rotational speed greater than 500 revolutions per minute.

8. The concrete production apparatus of Claim 4 wherein said housing includes a positionally adjustable discharge opening.

9. The concrete mixer of Claim 4 wherein said mixing plate is also formed with blades positioned in said inner chamber to direct material outwardly toward said annular gap for passage into said outer chamber.

10. A turbine mixer for a concrete production system having a supply of cement, a supply of water, a supply of aggregate and a mixing apparatus for combining cement, water and aggregate to form concrete comprising:

a housing having an inlet opening therein for communication with said supply of cement to receive said cement therefrom;

an inlet port supported on said housing and connected with said supply of water;

a mixing chamber to receive said cement from said supply of cement and water through said inlet port; and

a mixing member operably supported in said mixing chamber to mix said cement and said water into a cement paste to be discharged from said mixing chamber for subsequent mixing with aggregate to form a concrete mix.

11. The turbine mixer of Claim 10 wherein said mixing member is formed as a rotatably supported mixing plate having a plurality of agitating fins mounted thereon to effect a mixing of said cement and said water to create said cement paste.

12. The turbine mixer of Claim 11 wherein said mixing chamber is formed as a cylindrical structure having a first diameter, said mixing plate having a second diameter smaller than said first diameter to form an annular gap between said mixing plate and said cylindrical structure, said mixing plate dividing said cylindrical structure into an inner chamber and an outer chamber, said cement and said water being received in said inner chamber and said cement paste being discharged from said outer chamber, said agitating fins being mounted on a circumferential periphery of said mixing plate for movement along said annular gap.

13. The turbine mixer of Claim 12 wherein said mixing plate is also formed with blades positioned in said inner chamber to direct material outwardly toward said annular gap for passage therethrough into said outer chamber.

14. The turbine mixer of Claim 13 further comprising an auger rotatably supported in said housing to direct said cement into said inner chamber of said mixing chamber, said mixing plate being attached to a shaft on which said auger is mounted, said shaft being rotated by a drive mechanism for rotation of said auger and mixing plate at a rotational speed greater than 500 revolutions per minute

15. The turbine mixer of Claim 10 further comprising:
a metering mechanism to meter the flow of cement into said mixing chamber.
16. The turbine mixer of Claim 15 wherein said housing includes a discharge port and an adjustable slide plate having a discharge opening therein registrable with said discharge port, said adjustable slide plate being movable on said housing to vary the position of the discharge opening from said housing for varying the mixing operation of the mixing member.
17. A method of making concrete comprising the steps of:
introducing a supply of cement into a turbine mixer having a mixing member rotatably supported within a mixing chamber;
adding water into said mixing chamber to be combined with said cement;
rotating said mixing member at a rate of speed to break-up said cement and said water into fine particles to enhance the hydration of the cement particles and create a cement paste;
discharging said cement paste from said mixing chamber; and
combining said cement paste with aggregate to form a concrete mixture.

18. The method of Claim 17 wherein said mixing member divides said mixing chamber into an inner chamber and an outer chamber, said rotating step including the steps of:

agitating said cement and said water in said inner chamber with agitating fins mounted on said mixing member; and

entraining air into said cement paste.

19. The method of Claim 18 further comprising the steps of:

passing said cement paste through an annular gap between said mixing member and said mixing chamber to move said cement paste from said inner chamber to said outer chamber; and

further agitating said cement paste with additional agitating fins in said outer chamber to entrain air therein.

20. The method of Claim 19 wherein said turbine mixer is mounted on a mobile concrete production machine carrying said supplies of cement, water and aggregate, said combining step including the steps of:

conveying said cement paste from said mixing chamber; and

combining said cement paste with said aggregate in a mixer auger located remotely from said turbine mixer.

21. The method of Claim 17 wherein said rotating step rotates said mixing member at a rate of speed greater than 500 revolutions per minute.
22. The method of Claim 17 further comprising the step of adding at least one admixture into said mixing chamber to be mixed into said cement paste before said discharging step.
23. The method of Claim 17 further comprising the step of positionally adjusting a discharge port in said mixing chamber from which said cement paste is discharged to effect a desired amount of mixing of said cement and said water.
24. In a method of making concrete in which cement, water and aggregates are mixed to form a concrete mixture, the improvement comprising:
- pre-mixing the cement and water in a mixing apparatus that breaks up cement and water into small particles to infuse the cement particles into the water particles and create a cement slurry; and
- discharging the cement slurry from the mixing apparatus to be combined with said aggregates and create said concrete mixture.

25. The method of Claim 24 wherein said pre-mixing step includes the step of:
rotating said mixing apparatus at a high speed in a turbine mixer that
receives said cement and said water to be combined therein.

26. The method of Claim 25 further comprising the step of:
metering the inflow of cement into the turbine mixer.

27. The method of Claim 26 wherein said mixing apparatus is mounted in a
mixing chamber in a manner to divide the mixing chamber into an inner chamber and an
outer chamber, said pre-mixing step further including the steps of:

introducing said metered inflow of cement into said inner chamber through
an inlet opening;

adding said water into said inner chamber through an inlet port; and

agitating said cement and said water in said inner chamber with agitating
fins mounted on said mixing apparatus.

28. The method of Claim 27 wherein said agitating step includes the step of:
entraining air into said cement paste.

29. The method of Claim 27 wherein said pre-mixing step further includes the steps of:

passing said cement paste through an annular gap between said mixing apparatus and said mixing chamber to move said cement slurry from said inner chamber to said outer chamber; and

further agitating said cement paste with additional agitating fins in said outer chamber; and

said discharging step including the discharge of said cement slurry from said outer chamber.

30. The method of Claim 29 wherein said rotating step rotates said mixing apparatus at a rate of speed greater than 500 revolutions per minute.

31. The method of Claim 27 further comprising the step of adding at least one admixture into said mixing chamber to be mixed into said cement slurry before said discharging step.

32. The method of Claim 27 further comprising the step of positionally adjusting a discharge port on said mixing chamber from which said cement slurry is discharged to vary a desired amount of mixing of said cement and said water in said mixing chamber.

33. A turbine mixer for pre-mixing cement and water to create a cement slurry to be combined with aggregates for the production of a concrete mixture comprising:

a mixing chamber rotatably supporting a mixing apparatus operable at high speeds to break-up cement and water into fine particles to be combined to form said cement slurry; and

a metering mechanism to control the rate of inflow of cement into the mixing chamber.

34. The turbine mixer of Claim 33 wherein said mixing apparatus includes:

a mixing plate having a plurality of agitating fins mounted thereon to effect an atomization of said cement and said water to create said cement slurry.

35. The turbine mixer of Claim 34 wherein said mixing plate divides said mixing chamber into an inner chamber and an outer chamber, said cement and said water being received in said inner chamber and said cement slurry being discharged from said outer chamber, said agitating fins being mounted on a circumferential periphery of said mixing plate.

36. The turbine mixer of Claim 35 wherein said mixing chamber is formed as a cylindrical structure having a first diameter, said mixing plate having a second diameter smaller than said first diameter to form an annular gap between said mixing plate and said cylindrical structure, said cement slurry passing through said annular gap to move from said inner chamber to said outer chamber to be discharged from said mixing chamber.

37. The turbine mixer of Claim 36 further comprising:
a housing having an inlet opening therein for communication with said metering mechanism for the metered supply of cement into said mixing chamber;
an inlet port supported on said housing and connected with a supply of water;
said mixing chamber receiving dry cement through an inlet opening and water through said inlet port.

38. The turbine mixer of Claim 36 wherein said mixing plate is also formed with blades positioned in said inner chamber to direct material outwardly toward said annular gap for passage therethrough into said outer chamber.

39. The turbine mixer of Claim 35 wherein said mixing chamber includes a discharge port and an adjustable slide plate having a discharge opening therein registrable with said discharge port, said adjustable slide plate being movable on said outer chamber to vary the position of the discharge opening relative to said agitating fins on said mixing plate for varying the mixing operation of the mixing apparatus.